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PROBLEM OF LEUKOSES

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During recent years an extensive array of experimental and clinical data has been accumulated which is of great significance for further research on the problem of leukoses.

On the basis of the investigations which have been carried out, one may assert that leukoses are a special form of malignant neoplasms. The similarity between leukoses and tumors is expressed not only in the fact that similar morphological changes take place, but also in the biological characteristics of tissue growth.

Experimental data show that blastomogenic substances extracted from various tissues of patients who have died of a leukosis bring about in the majority of experimental animals the development of tumors in addition to producing various types of leukoses. The blastomogenic activity of some of these extracts proved to be greater than that of the known chemical cancerogenic substances.

The significance of endogenic blastomogenic factors in the origin of leukoses is demonstrated also by immunological investigations, for instance, by using the method of anaphylaxis accompanied by desensitization. Finally, many-sided cytomorphological and cytophysiological investigations established that the biological characteristics of the blood components of patients suffering from leukosis resemble the biological properties of the cells of malignant tumors.

By analogy with generally known data regarding the significance of the functional condition of the nervous system and of the system of connective tissue in the origin of tumor processes, it was possible to prove with certainty in recent work the role of these pathogenetic mechanisms in the development of leukoses.

Of great scientific, theoretical, and practical significance is the new classification of leukoses, which has been drawn up with consideration of the clinical manifestations of the pathogenic process and of its histogenesis. In this classification emphasis has been placed on the clinicoanatomical and histogenic phases of development and on the interrelationship which exists between reticulosis, hemocytoblastosis, and other forms of leukoses. In addition, the new classification reflects the important principle that leukoses must be regarded as neoplastic conditions.

Contemporary clinical medicine, unfortunately, does not yet have at its disposal pathogenetic methods for the therapy of leukoses. For that reason, the therapeutic measures to be applied in the treatment of this type of disease amounts to the use of various symptomatic methods of treatment with allowance for individual peculiarities marking the course of the leukemic processes.

The method which has been used during recent years in the therapy of acute leukoses consists of the infusion of erythrocytic mass and the

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administration of antibiotics, hormones (adrenocorticotrophic hormone, cortisone), and of ascorbic acid. Application of this method results merely in the alleviation of some of the symptoms of the disease. When this method is applied, the disease proceeds without pronounced leukoses, while development of anemia and of hemorrhagic phenomena proceeds slowly. There is also a reduction in the temperature during fever reactions and alleviation of toxic phenomena and of pain in the bones.

The comprehensive ("complex") therapy of chronic leukoses often results in clinical remission consisting in the reduction of the foci of leukemic infiltration, cessation of the progress of anemia, and prevention of the development of secondary infections.

Although the experimental and clinical data obtained lately are of great theoretical and practical significance, the problem of leukoses has not been solved as yet. This problem can only be solved by the combined efforts of scientists in different fields of knowledge i.e., clinicians, physiologists, morphologists, pathophysiologists, and biochemists.

Notwithstanding numerous investigations which are being conducted in different fields of medicine, we still cannot arrive at any final conclusions in regard to the etiology of leukoses. It is true that there are convincing data which speak in favor of the role of viruslike agents and chemical factors in the etiology of leukoses. Expansion of research along these lines will be of great significance from the standpoint of the development of effective methods for the treatment of leukoses.

As far as experimental work is concerned, it is necessary to expand work on the creation of experimental models of various forms of leukoses. This work will form a basis for extensive research on effective methods of experimental therapy and prophylaxis of the diseases in question.

It is well known that urethan, embikhin, and other drugs which are used at present for the suppression of the foci of leukemic infiltration bring about in various degrees pronounced morphological changes in such vitally important organs as, for instance, the liver. For that reason it is necessary to carry out special work on lowering the toxicity of the drugs applied.

As far as clinical work is concerned, one must continue the investigation of differential indications for the application of urethan, embikhin, the radioactive isotopes of phosphorus, and of X-rays, which exert a favorable effect on the foci of leukemic infiltration. Clinicians must search more persistently for the most favorable conditions which will contribute to the lowering of the toxic effects produced by these drugs and resulting from these methods.

Lately a great deal of attention has been paid to the application of various symptomatically acting drugs in the comprehensive therapy of leukoses. This applies to antibiotics only to a minor extent, although antibiotics are widely used in the treatment of the pathological processes involved. We do not have as yet clearly delimited indications for the application of individual antibiotics or of combinations of antibiotics in leukoses. Special work must be devoted to this problem.

A new approach, i.e., that of the immunotherapy of leukoses, has been made quite recently. Clinical data which are available indicate that cytotoxic, antitoxic, and antiblastomatous sera in combination with other means have a favorable effect on the course of the leukemic process. Investigative work along these lines, which seems very promising both from the theoretical and practical standpoint, should be continued in the future.

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In work on the problem of leukoses it is expedient to apply on a wider scale the methods of immunological research. Particular attention should be paid to the study of the serology of leukocytes. At present one may consider as proven that leukocytes possess a number of specific antigenic properties. One must attempt to isolate from the blood of patients suffering from leukoses various leukolysins, leukoagglutinins, leukoosonins, and other antileukocytic antibodies.

It is also necessary to carry out special work devoted to the investigation of the serological properties of thrombocytes in leukosis patients. In research on the properties of antileukocytic and antithrombocytic antibodies it is advisable to apply the methods of electrophoretic analysis.

The data obtained in the course of this work ought to increase our understanding of the role of immunological shifts in the development and course of the leukemic process and also contribute to the development of effective methods of therapy.

At the present stage, only a small number of observations has been made as far as application of individual hormone preparations in the therapy of leukoses is concerned. This refers particularly to the application of adrenocorticotrophic hormone and cortisone. However, even the meager data which are available testify to the very favorable effect of these agents on the general condition of the patients. Our immediate task is to expedite by every possible means the comprehensive investigation of these preparations from the standpoint of their use in the therapy of leukoses.

At present we have developed a method of preparing a new transfusion agent, i.e., the leukocytic mass, and have devised a method of transfusing it to patients. The leukocytic mass is used successfully in the therapy of leukopenic conditions of various origin.

Taking into consideration the highly important role of leukocytes, particularly of granulocytes, in the processes of phagocytosis, and also their capacity to exert a stimulating effect on the regeneration of the tissues, we must consider as expedient the carrying out of special research on the therapeutic effects exerted by the leukocytic mass on the clinical course of various forms of leukosis.

It is also important to conduct work on the application in the therapy of leukoses of blood prepared without the use of stabilizers and with the aid of ion-exchange adsorbents. Data which have been obtained at our clinic indicate that the absence in the preserved blood of sodium citrate, which exerts a harmful effect on the blood formation elements, enhances the biological effectiveness of the blood, so that an effect approaching that produced by blood that has been transfused directly from a donor is obtained.

It is essential to pay the necessary attention to investigations dealing with the effect on the course of leukoses of trephoned [sic] plasma and of analogous agents, which contribute, as is known, to the normal development of cells.

One must also expand the study of other problems pertaining to leukosis. Of undoubted interest is the work aiming at a comprehensive investigation of the metabolic and enzymatic processes in leukoses. One must also continue the research, which is very interesting both with respect to theory and practical results, on the cytological, biochemical, and cytochemical characteristics of blood components and of the elements of blood-forming organs in leukoses. As a result of this work, a clear concept of the characteristics of blood formation in leukoses will be formed.

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Of great significance in understanding the nature of the hemorrhages which occur in various stages of the development of leukemic processes will be a dynamic investigation of the hemorrhagic syndrome and of the state of the vascular system. These investigations should be carried out with the use of capillaroscopic, oscillographic, and other methods.

The data obtained in this work will be of help in developing effective methods for the treatment of hemorrhages which occur in leukoses.

At a plenary session of the Scientific Council of the Central Order of Lenin Institute of Hematology and Blood Transfusion, which was conducted together with the Subject Matter ["Problem"] Commission on Hematology of the Ministry of Health USSR and of the Academy of Medical Sciences USSR, the most important tasks have been discussed which must be dealt with by experimental and clinical hematology in the fields of the etiology, pathogenesis, and therapy of leukoses.

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